



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/098,832	06/17/1998	JARI HAMALAINEN	442-008040-U	4557

7590 05/16/2003  
PERMAN & GREEN  
425 POST ROAD  
FAIRFIELD, CT 064306232

EXAMINER

PHAN, MAN U

ART UNIT	PAPER NUMBER
----------	--------------

2665

DATE MAILED: 05/16/2003

15

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/098,832

Applicant(s)

Hamalainen et al.

Examiner

Man Phan

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Mar 14, 2003
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.
- ## Disposition of Claims
- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other:

### **DETAILED ACTION**

1. This communication is in response to applicant's 03/14/2003 Amendment in the application of Hamalainen et al. for a "Time division multiple access radio systems" filed 06/17/1998. This application claims foreign priority based on the application 972724 dated 06/24/1997 filed in Finland. This application is a Continued Prosecution Application (CPA) filed on March 14, 2003. The amendment to the claims has been entered and made of record. A preliminary amendment to the claims have been entered and made of record. The independent claims 1, 5 and 6 have been amended. Claims 1-6 are pending in the application.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2, 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson (US#5,442,635) in view of Ohta (US#5,878,277) and further in view of Crisler et al. (US#5,594,738).

With respect to claims 1-2, 5-6, these references teaches the capability of effectively and efficiently carrying out multislot capabilities and utilizing half duplex transmission/reception. Persson (US#5,442,635) discloses a method for dividing a frame structure for a mobile telephone system which operates in *half-duplex*, i.e. in which the *transmission and reception of signals in a mobile takes place within mutually separate time-slots* (TS0 and TM0 respectively). Each frame includes three time-slots, each intended for transmission and reception. According to the method, the frame structure is divided so that transmission (TX) first takes place in a transmission time-slot (TS0). Reception (RX) then takes places in a reception time-slot (TM0) which is separate from the transmission time-slot (TS0). Subsequent to reception (RX), the frame structure includes an idle time (t.sub.1) which remains until further transmission (TX) takes place in the next-following frame. The method enables the frequency synthesizer (FM) of the

mobile in the reception direction to be set to a channel (f.sub.x) different to the reception channel (f.sub.m) and then to be reset accurately to the reception channel (f.sub.m) (Figs. 3, 4 and the Abstract). However, Persson does not expressly disclose the step of allocating a greater number of times slots in each downlink TDMA frame than in each uplink TDMA frame. In the same field of the endeavor, Ohta (US#5,878,277) teaches in Fig. 2A illustrated a diagram showing the assignment of frequency bands used on a communication path in accordance with the present invention. An entire band 10 utilized for uplink signals transmitted from the terminals 5-1, 5-2 to the head end 1 ranges from *10 to 50 MHZ*, while an entire band 20 utilized for downlink signals reversely transmitted from the head end 1 to the terminal side ranges from *70 to 450 MHZ*. The multimedia communications system according to the present invention utilizes three empty bandwidths (6 MHZ/channel) (indicated by hatched portions in FIG. 2A) 15, 25 in each of the uplink and downlink frequency bands, which have been originally assigned to the transmission of TV signals but are not actually used therefor in the CATV, for bi-directional transmission of audio signals (for telephones and facsimile apparatuses) and data signals (for computers). For more specific illustrations, exemplary assignments of signal bands in each of bandwidths 15, 25 indicated by hatched portions in Fig. 2A are shown in greater detail in Figs. 2B and 2C, respectively (Col. 8, lines 37 plus). Unlike a common TDD technique in which fixed time slots are allocated to uplink and downlink transmission, an STDD or PSTDD technique allows time slots to be dynamically allocated to either uplink or downlink transmission in accordance with demand, in favor of uplink or downlink.

Persson and Ohta fail to expressly disclose the TDMA radio system having multi-slot capabilities; and wherein TDMA frames for uplink user data transmissions are separate from TDMA frames for downlink user data transmissions. However, in accordance with the GSM standards, a multi-slot mode ( "multi-slot" reception and transmission) of operation is defined, in which a mobile station transmits and/or receives in several time slots within each TDMA frame. In the same field of endeavor, Crisler et al. (US#5,594,738) discloses a method and system for allocating time slots in in a multi-carrier, multi-slot communication system. Crisler teaches in Fig. 1 illustrated a TDMA communication system 100 that includes a time slot allocator 101. The communication unit 102 transmits information to the base stations via an uplink TDM channel 106 and receives information from the base stations via a downlink TDM channel 113 separately (Col. 3; lines 25 plus).

One skilled in the art would have recognized the need for efficiently providing a method and system for allocating of time slots in uplink/downlink TDMA frames using half duplex, and would have applied Crisler's TDMA frames for uplink and downlink; Ohta's novel use of the frequency assignment of the frequency bands used on a communication path into Persson's teaching of the division of the frame structure when transmitting and receiving signals in a mobile station. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Crisler's time slot allocation method, and Ohta' communication system having at least two types of communication channels into Persson's method for dividing a frame structure in a mobile station with the motivation being to provide a system and method

for operating a TDMA radio system having multi slot capabilities and utilizing half duplex.

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson (US#5,442,635) in view of Ohta (US#5,878,277) and Crisler et al. (US#5,594,738) as applied to the claims above, and further in view of Galyas et al. (US#6,205,157).

With respect to the claims 3-4, these claims differ from claims above in that the claims require wherein the TDMA radio system utilises the GPRS and HSCSD protocols. Currently, the Global System for Mobile Communication (GSM) based PCS systems operate at 1900 MHZ, and support only up to a rate of 9.6 Kbps for data transfer. Higher rate wideband applications are constantly being sought after to meet the ever growing demand of wireless communication services. Accordingly, High Speed Circuit Switched Data (HSCSD) and General Packet Radio Services (GPRS) are being standardized to accommodate this grave need. In the same field of endeavor, Galyas (US#6,205,157) teaches in Fig. 3 illustrated in more detail, the transport network 45 between the mobile station 15, base transceiver station 30 and interworking function 40 or PCU 46. With the further development of user applications within a public land mobile network (PLMN), a number of high capacity non-speech data services have been introduced. Such services include all circuit-switched data services as defined in TSGSM02.02 and TSGSM02.03, as well as other GSM phase 2+services, including facsimile transmission, high-speed circuit-switched data (HSCSD), high-speed modem connections, and general packet radio

services (GPRS). As a result, a telecommunications module known as an interworking function (IWF) 40 has been developed to enable the transmission and protocol adaptation from one telecommunications network, such as a connected PSTN 50, to the serving PLMN. The IWF 40 may be co-located with a particular mobile switching center (MSC) serving a designated geographic area or may be implemented as a separate telecommunications node. The IWF 40 is connected to a transcoder/rate adapter unit (TRAU) 55. The TRAU 55 is further connected to a number of base transceiver stations (BTS) 30 providing radio coverage for mobile stations 15 located within the serving MSC coverage area (Col. 3, lines 31 plus).

One skilled in the art would have recognized the need for efficiently providing a method and system for allocating of time slots in uplink/downlink TDMA frames using half duplex, and would have applied Galyas's delays generated within a GPRS, HSCSD; Crisler's TDMA frames for uplink and downlink and Ohta's novel use of the frequency assignment of the frequency bands used on a communication path into Persson's teaching of the division of the frame structure when transmitting and receiving signals in a mobile station. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Galyas' method for propagation delay control, Crisler's time slot allocation method, and Ohta' communication system having at least two types of communication channels into Persson's method for dividing a frame structure in a mobile station with the motivation being to provide a system and method for operating a TDMA radio system having multi slot capabilities and utilizing half duplex.



***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Seshadri et al. (US#5,420,851) is cited to show the method of multiple access

The Takefman (US#5,761,197) is cited to show the communication in a distribution network

The Larsson et al. (US#5,956,642) is cited to show the adaptive channel allocation method and apparatus for multi-slot, multi-carrier communication system.

The Uddenfeldt (US#5,805,633) is cited to show the method and apparatus for frequency planning in a multi system cellular communication network.

The Poon et al. (US#5,940,380) is cited to show the method and arrangement relating to radio communication networks

The Jokinen et al. (US#5,729,534) is cited to show the dynamic allocation of radio capacity in a TDMA system.

The Hamalainen et al. (US#5,729,541) is cited to show the system for transmitting packet data in radio telephone TDMA systems.

The Kanerva et al. (US#6,240,076) is cited to show the asymmetric high speed data transmission apparatus and method in a mobile communications network.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (703)305-1029. The

examiner can normally be reached on Mon - Fri from 6:30 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

8. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:** (703) 305-9051, (for formal communications intended for entry)

**Or:** (703) 305-3988 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021

Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Mphan

05/13/2003

*Man u. phan*